

SEQUENCE LISTING

<110> Wilson, James M.
Xiao, Weidong

<120> Adeno-Associated Virus Serotype I Nucleic Acid Sequences,
Vectors and Host Cells Containing Same

<130> GNVPN.031USA

<140> US 09/807,802
<141> 2001-04-17

<150> US 60/107,114
<151> 1998-11-05

<150> PCT/US99/25694
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<170> PatentIn version 3.1

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Pro	Pro	Ala	Asp	Ile	Lys	Thr	Asn	Arg	Ile	Tyr	Arg	Ile	Leu	Glu	Leu	
		290				295					300					
Asn	Gly	Tyr	Glu	Pro	Ala	Tyr	Ala	Gly	Ser	Val	Phe	Leu	Gly	Trp	Ala	
305					310					315					320	
Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
				325					330					335		

Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
			340					345					350			
Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
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Cys	Val	Asp	Lys	Met	Val	Ile	Trp	Trp	Glu	Glu	Gly	Lys	Met	Thr	Ala	
	370					375					380					
Lys	Val	Val	Glu	Ser	Ala	Lys	Ala	Ile	Leu	Gly	Gly	Ser	Lys	Val	Arg	
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Val	Asp	Gln	Lys	Cys	Lys	Ser	Ser	Ala	Gln	Ile	Asp	Pro	Thr	Pro	Val	
				405					410					415		
Ile	Val	Thr	Ser	Asn	Thr	Asn	Met	Cys	Ala	Val	Ile	Asp	Gly	Asn	Ser	
			420					425					430			
Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	Arg	Met	Phe	Lys	Phe	
		435					440					445				
Glu	Leu	Thr	Arg	Arg	Leu	Glu	His	Asp	Phe	Gly	Lys	Val	Thr	Lys	Gln	
	450					455					460					
Glu	Val	Lys	Glu	Phe	Phe	Arg	Trp	Ala	Gln	Asp	His	Val	Thr	Glu	Val	
465					470					475					480	
Ala	His	Glu	Phe	Tyr	Val	Arg	Lys	Gly	Gly	Ala	Asn	Lys	Arg	Pro	Ala	
				485					490					495		
Pro	Asp	Asp	Ala	Asp	Lys	Ser	Glu	Pro	Lys	Arg	Ala	Cys	Pro	Ser	Val	
			500					505					510			
Ala	Asp	Pro	Ser	Thr	Ser	Asp	Ala	Glu	Gly	Ala	Pro	Val	Asp	Phe	Ala	
		515					520					525				
Asp	Arg	Tyr	Gln	Asn	Lys	Cys	Ser	Arg	His	Ala	Gly	Met	Leu	Gln	Met	
	530					535					540					
Leu	Phe	Pro	Cys	Lys	Thr	Cys	Glu	Arg	Met	Asn	Gln	Asn	Phe	Asn	Ile	
545					550					555					560	
Cys	Phe	Thr	His	Gly	Thr	Arg	Asp	Cys	Ser	Glu	Cys	Phe	Pro	Gly	Val	
				565					570					575		
Ser	Glu	Ser	Gln	Pro	Val	Val	Arg	Lys	Arg	Thr	Tyr	Arg	Lys	Leu	Cys	
			580					585					590			
Ala	Ile	His	His	Leu	Leu	Gly	Arg	Ala	Pro	Glu	Ile	Ala	Cys	Ser	Ala	
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			20					25					30			
Lys	Ala	Asn	Gln	Gln	Lys	Gln	Asp	Asp	Gly	Arg	Gly	Leu	Val	Leu	Pro	
		35					40					45				
Gly	Tyr	Lys	Tyr	Leu	Gly	Pro	Phe	Asn	Gly	Leu	Asp	Lys	Gly	Glu	Pro	
	50					55					60					
Val	Asn	Ala	Ala	Asp	Ala	Ala	Ala	Leu	Glu	His	Asp	Lys	Ala	Tyr	Asp	
65					70					75					80	
Gln	Gln	Leu	Lys	Ala	Gly	Asp	Asn	Pro	Tyr	Leu	Arg	Tyr	Asn	His	Ala	
				85					90					95		
Asp	Ala	Glu	Phe	Gln	Glu	Arg	Leu	Gln	Glu	Asp	Thr	Ser	Phe	Gly	Gly	
			100					105					110			
Asn	Leu	Gly	Arg	Ala	Val	Phe	Gln	Ala	Lys	Lys	Arg	Val	Leu	Glu	Pro	
		115					120					125				
Leu	Gly	Leu	Val	Glu	Glu	Gly	Ala	Lys	Thr	Ala	Pro	Gly	Lys	Lys	Arg	
	130					135					140					
Pro	Val	Glu	Gln	Ser	Pro	Gln	Glu	Pro	Asp	Ser	Ser	Ser	Gly	Ile	Gly	
145					150					155					160	
Lys	Thr	Gly	Gln	Gln	Pro	Ala	Lys	Lys	Arg	Leu	Asn	Phe	Gly	Gln	Thr	
				165					170					175		
Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro	Gln	Pro	Leu	Gly	Glu	Pro	Pro	
			180					185					190			
Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr	Thr	Met	Ala	Ser	Gly	Gly	Gly	
		195					200					205				
Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly	Ala	Asp	Gly	Val	Gly	Asn	Ala	
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Ser	Gly	Asn	Trp	His	Cys	Asp	Ser	Thr	Trp	Leu	Gly	Asp	Arg	Val	Ile	
225					230					235					240	
Thr	Thr	Ser	Thr	Arg	Thr	Trp	Ala	Leu	Pro	Thr	Tyr	Asn	Asn	His	Leu	
				245					250					255		
Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr	Gly	Ala	Ser	Asn	Asp	Asn	His	
			260					265					270			
Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	Phe	Asp	Phe	Asn	Arg	Phe	
		275					280					285				
His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp	Gln	Arg	Leu	Ile	Asn	Asn	Asn	
	290					295					300					
Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn	Phe	Lys	Leu	Phe	Asn	Ile	Gln	

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Val	Lys	Glu	Val	Thr 325	Thr	Asn	Asp	Gly	Val 330	Thr	Thr	Ile	Ala	Asn 335	Asn		
Leu	Thr	Ser	Thr 340	Val	Gln	Val	Phe	Ser 345	Asp	Ser	Glu	Tyr	Gln 350	Leu	Pro		
Tyr	Val	Leu 355	Gly	Ser	Ala	His	Gln 360	Gly	Cys	Leu	Pro	Pro 365	Phe	Pro	Ala		
Asp	Val 370	Phe	Met	Ile	Pro	Gln 375	Tyr	Gly	Tyr	Leu	Thr 380	Leu	Asn	Asn	Gly		
Ser 385	Gln	Ala	Val	Gly	Arg 390	Ser	Ser	Phe	Tyr	Cys 395	Leu	Glu	Tyr	Phe	Pro 400		
Ser	Gln	Met	Leu	Arg 405	Thr	Gly	Asn	Asn	Phe 410	Thr	Phe	Ser	Tyr	Thr 415	Phe		
Glu	Glu	Val	Pro 420	Phe	His	Ser	Ser	Tyr 425	Ala	His	Ser	Gln	Ser 430	Leu	Asp		
Arg	Leu	Met 435	Asn	Pro	Leu	Ile	Asp 440	Gln	Tyr	Leu	Tyr	Tyr 445	Leu	Asn	Arg		
Thr	Gln 450	Asn	Gln	Ser	Gly	Ser 455	Ala	Gln	Asn	Lys	Asp 460	Leu	Leu	Phe	Ser		
Arg 465	Gly	Ser	Pro	Ala	Gly 470	Met	Ser	Val	Gln	Pro	Lys 475	Asn	Trp	Leu	Pro 480		
Gly	Pro	Cys	Tyr	Arg 485	Gln	Gln	Arg	Val	Ser 490	Lys	Thr	Lys	Thr	Asp 495	Asn		
Asn	Asn	Ser	Asn 500	Phe	Thr	Trp	Thr	Gly 505	Ala	Ser	Lys	Tyr	Asn 510	Leu	Asn		
Gly	Arg	Glu 515	Ser	Ile	Ile	Asn	Pro 520	Gly	Thr	Ala	Met	Ala 525	Ser	His	Lys		
Asp	Asp 530	Glu	Asp	Lys	Phe	Phe 535	Pro	Met	Ser	Gly	Val 540	Met	Ile	Phe	Gly		
Lys 545	Glu	Ser	Ala	Gly	Ala 550	Ser	Asn	Thr	Ala	Leu 555	Asp	Asn	Val	Met	Ile 560		
Thr	Asp	Glu	Glu	Glu 565	Ile	Lys	Ala	Thr	Asn 570	Pro	Val	Ala	Thr	Glu 575	Arg		
Phe	Gly	Thr	Val 580	Ala	Val	Asn	Phe	Gln 585	Ser	Ser	Ser	Thr	Asp 590	Pro	Ala		
Thr	Gly	Asp 595	Val	His	Ala	Met	Gly 600	Ala	Leu	Pro	Gly	Met 605	Val	Trp	Gln		
Asp	Arg 610	Asp	Val	Tyr	Leu	Gln 615	Gly	Pro	Ile	Trp	Ala	Lys	Ile	Pro	His		
Thr	Asp	Gly	His	Phe	His	Pro	Ser	Pro	Leu	Met	Gly	Gly	Phe	Gly	Leu		

625						630						635						640
Lys	Asn	Pro	Pro	Pro	Gln	Ile	Leu	Ile	Lys	Asn	Thr	Pro	Val	Pro	Ala			
				645					650					655				
Asn	Pro	Pro	Ala	Glu	Phe	Ser	Ala	Thr	Lys	Phe	Ala	Ser	Phe	Ile	Thr			
			660					665					670					
Gln	Tyr	Ser	Thr	Gly	Gln	Val	Ser	Val	Glu	Ile	Glu	Trp	Glu	Leu	Gln			
		675					680					685						
Lys	Glu	Asn	Ser	Lys	Arg	Trp	Asn	Pro	Glu	Val	Gln	Tyr	Thr	Ser	Asn			
	690					695					700							
Tyr	Ala	Lys	Ser	Ala	Asn	Val	Asp	Phe	Thr	Val	Asp	Asn	Asn	Gly	Leu			
705					710					715					720			
Tyr	Thr	Glu	Pro	Arg	Pro	Ile	Gly	Thr	Arg	Tyr	Leu	Thr	Arg	Pro	Leu			
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1				5					10					15				
gag	cac	ctg	ccg	ggc	att	tct	gac	tcg	ttt	gtg	agc	tgg	gtg	gcc	gag	96		
Glu	His	Leu	Pro	Gly	Ile	Ser	Asp	Ser	Phe	Val	Ser	Trp	Val	Ala	Glu			
			20					25					30					
aag	gaa	tgg	gag	ctg	ccc	ccg	gat	tct	gac	atg	gat	ctg	aat	ctg	att	144		
Lys	Glu	Trp	Glu	Leu	Pro	Pro	Asp	Ser	Asp	Met	Asp	Leu	Asn	Leu	Ile			
		35					40					45						
gag	cag	gca	ccc	ctg	acc	gtg	gcc	gag	aag	ctg	cag	cgc	gac	ttc	ctg	192		
Glu	Gln	Ala	Pro	Leu	Thr	Val	Ala	Glu	Lys	Leu	Gln	Arg	Asp	Phe	Leu			
		50				55					60							
gtc	caa	tgg	cgc	cgc	gtg	agt	aag	gcc	ccg	gag	gcc	ctc	ttc	ttt	gtt	240		
Val	Gln	Trp	Arg	Arg	Val	Ser	Lys	Ala	Pro	Glu	Ala	Leu	Phe	Phe	Val			
65					70					75				80				
cag	ttc	gag	aag	ggc	gag	tcc	tac	ttc	cac	ctc	cat	att	ctg	gtg	gag	288		
Gln	Phe	Glu	Lys	Gly	Glu	Ser	Tyr	Phe	His	Leu	His	Ile	Leu	Val	Glu			
				85				90						95				
acc	acg	ggg	gtc	aaa	tcc	atg	gtg	ctg	ggc	cgc	ttc	ctg	agt	cag	att	336		
Thr	Thr	Gly	Val	Lys	Ser	Met	Val	Leu	Gly	Arg	Phe	Leu	Ser	Gln	Ile			
			100					105					110					

agg gac aag ctg gtg cag acc atc tac cgc ggg atc gag ccg acc ctg Arg Asp Lys Leu Val Gln Thr Ile Tyr Arg Gly Ile Glu Pro Thr Leu 115 120 125	384
ccc aac tgg ttc gcg gtg acc aag acg cgt aat ggc gcc gga ggg ggg Pro Asn Trp Phe Ala Val Thr Lys Thr Arg Asn Gly Ala Gly Gly Gly 130 135 140	432
aac aag gtg gtg gac gag tgc tac atc ccc aac tac ctc ctg ccc aag Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn Tyr Leu Leu Pro Lys 145 150 155 160	480
act cag ccc gag ctg cag tgg gcg tgg act aac atg gag gag tat ata Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn Met Glu Glu Tyr Ile 165 170 175	528
agc gcc tgt ttg aac ctg gcc gag cgc aaa cgg ctc gtg gcg cag cac Ser Ala Cys Leu Asn Leu Ala Glu Arg Lys Arg Leu Val Ala Gln His 180 185 190	576
ctg acc cac gtc agc cag acc cag gag cag aac aag gag aat ctg aac Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Leu Asn 195 200 205	624
ccc aat tct gac gcg cct gtc atc cgg tca aaa acc tcc gcg cgc tac Pro Asn Ser Asp Ala Pro Val Ile Arg Ser Lys Thr Ser Ala Arg Tyr 210 215 220	672
atg gag ctg gtc ggg tgg ctg gtg gac cgg ggc atc acc tcc gag aag Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys 225 230 235 240	720
cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala 245 250 255	768
tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys 260 265 270	816
atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala 275 280 285	864
ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu 290 295 300	912
aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala 305 310 315 320	960
cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala 325 330 335	1008
acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro 340 345 350	1056

ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat	1104
Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp	
355 360 365	
tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc	1152
Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala	
370 375 380	
aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc	1200
Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg	
385 390 395 400	
gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg	1248
Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val	
405 410 415	
atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggg aac agc	1296
Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser	
420 425 430	
acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt	1344
Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe	
435 440 445	
gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag	1392
Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln	
450 455 460	
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg	1440
Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val	
465 470 475 480	
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc	1488
Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala	
485 490 495	
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc	1536
Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val	
500 505 510	
gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc	1584
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala	
515 520 525	
gac agg tac caa aac aaa tgt tct cgt cac gcg ggc atg ctt cag atg	1632
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met	
530 535 540	
ctg ttt ccc tgc aag aca tgc gag aga atg aat cag aat ttc aac att	1680
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile	
545 550 555 560	
tgc ttc acg cac ggg acg aga gac tgt tca gag tgc ttc ccc ggc gtg	1728
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val	
565 570 575	
tca gaa tct caa ccg gtc gtc aga aag agg acg tat cgg aaa ctc tgt	1776
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys	
580 585 590	

gcc att cat cat ctg ctg ggg cgg gct ccc gag att gct tgc tcg gcc 1824
 Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala
 595 600 605

tgc gat ctg gtc aac gtg gac ctg gat gac tgt gtt tct gag caa taa 1872
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 610 615 620

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 Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile
 35 40 45
 Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu Gln Arg Asp Phe Leu
 50 55 60
 Val Gln Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val
 65 70 75 80
 Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Leu His Ile Leu Val Glu
 85 90 95
 Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg Phe Leu Ser Gln Ile
 100 105 110
 Arg Asp Lys Leu Val Gln Thr Ile Tyr Arg Gly Ile Glu Pro Thr Leu
 115 120 125
 Pro Asn Trp Phe Ala Val Thr Lys Thr Arg Asn Gly Ala Gly Gly Gly
 130 135 140
 Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn Tyr Leu Leu Pro Lys
 145 150 155 160
 Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn Met Glu Glu Tyr Ile
 165 170 175
 Ser Ala Cys Leu Asn Leu Ala Glu Arg Lys Arg Leu Val Ala Gln His
 180 185 190
 Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Leu Asn
 195 200 205
 Pro Asn Ser Asp Ala Pro Val Ile Arg Ser Lys Thr Ser Ala Arg Tyr
 210 215 220
 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys
 225 230 235 240

Gln	Trp	Ile	Gln	Glu	Asp	Gln	Ala	Ser	Tyr	Ile	Ser	Phe	Asn	Ala	Ala	
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Ser	Asn	Ser	Arg	Ser	Gln	Ile	Lys	Ala	Ala	Leu	Asp	Asn	Ala	Gly	Lys	
			260					265					270			
Ile	Met	Ala	Leu	Thr	Lys	Ser	Ala	Pro	Asp	Tyr	Leu	Val	Gly	Pro	Ala	
		275					280					285				
Pro	Pro	Ala	Asp	Ile	Lys	Thr	Asn	Arg	Ile	Tyr	Arg	Ile	Leu	Glu	Leu	
	290					295					300					
Asn	Gly	Tyr	Glu	Pro	Ala	Tyr	Ala	Gly	Ser	Val	Phe	Leu	Gly	Trp	Ala	
305					310					315					320	
Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
				325					330					335		
Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
			340					345					350			
Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
		355					360					365				
Cys	Val	Asp	Lys	Met	Val	Ile	Trp	Trp	Glu	Glu	Gly	Lys	Met	Thr	Ala	
	370					375					380					
Lys	Val	Val	Glu	Ser	Ala	Lys	Ala	Ile	Leu	Gly	Gly	Ser	Lys	Val	Arg	
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Val	Asp	Gln	Lys	Cys	Lys	Ser	Ser	Ala	Gln	Ile	Asp	Pro	Thr	Pro	Val	
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Ile	Val	Thr	Ser	Asn	Thr	Asn	Met	Cys	Ala	Val	Ile	Asp	Gly	Asn	Ser	
			420					425					430			
Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	Arg	Met	Phe	Lys	Phe	
		435					440					445				
Glu	Leu	Thr	Arg	Arg	Leu	Glu	His	Asp	Phe	Gly	Lys	Val	Thr	Lys	Gln	
	450					455					460					
Glu	Val	Lys	Glu	Phe	Phe	Arg	Trp	Ala	Gln	Asp	His	Val	Thr	Glu	Val	
465					470					475					480	
Ala	His	Glu	Phe	Tyr	Val	Arg	Lys	Gly	Gly	Ala	Asn	Lys	Arg	Pro	Ala	
				485					490					495		
Pro	Asp	Asp	Ala	Asp	Lys	Ser	Glu	Pro	Lys	Arg	Ala	Cys	Pro	Ser	Val	
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Ala	Asp	Pro	Ser	Thr	Ser	Asp	Ala	Glu	Gly	Ala	Pro	Val	Asp	Phe	Ala	
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Asp	Arg	Tyr	Gln	Asn	Lys	Cys	Ser	Arg	His	Ala	Gly	Met	Leu	Gln	Met	
	530					535					540					
Leu	Phe	Pro	Cys	Lys	Thr	Cys	Glu	Arg	Met	Asn	Gln	Asn	Phe	Asn	Ile	
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Cys	Phe	Thr	His	Gly	Thr	Arg	Asp	Cys	Ser	Glu	Cys	Phe	Pro	Gly	Val	
				565					570					575		
Ser	Glu	Ser	Gln	Pro	Val	Val	Arg	Lys	Arg	Thr	Tyr	Arg	Lys	Leu	Cys	
			580					585					590			
Ala	Ile	His	His	Leu	Leu	Gly	Arg	Ala	Pro	Glu	Ile	Ala	Cys	Ser	Ala	
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Glu	His	Leu	Pro	Gly	Ile	Ser	Asp	Ser	Phe	Val	Ser	Trp	Val	Ala	Glu	
			20					25					30			
aag gaa tgg gag ctg ccc ccg gat tct gac atg gat ctg aat ctg att 144																
Lys	Glu	Trp	Glu	Leu	Pro	Pro	Asp	Ser	Asp	Met	Asp	Leu	Asn	Leu	Ile	
		35					40					45				
gag cag gca ccc ctg acc gtg gcc gag aag ctg cag cgc gac ttc ctg 192																
Glu	Gln	Ala	Pro	Leu	Thr	Val	Ala	Glu	Lys	Leu	Gln	Arg	Asp	Phe	Leu	
		50				55					60					
gtc caa tgg cgc cgc gtg agt aag gcc ccg gag gcc ctc ttc ttt gtt 240																
Val	Gln	Trp	Arg	Arg	Val	Ser	Lys	Ala	Pro	Glu	Ala	Leu	Phe	Phe	Val	
65					70				75					80		
cag ttc gag aag ggc gag tcc tac ttc cac ctc cat att ctg gtg gag 288																
Gln	Phe	Glu	Lys	Gly	Glu	Ser	Tyr	Phe	His	Leu	His	Ile	Leu	Val	Glu	
				85				90					95			
acc acg ggg gtc aaa tcc atg gtg ctg ggc cgc ttc ctg agt cag att 336																
Thr	Thr	Gly	Val	Lys	Ser	Met	Val	Leu	Gly	Arg	Phe	Leu	Ser	Gln	Ile	
			100					105					110			
agg gac aag ctg gtg cag acc atc tac cgc ggg atc gag ccg acc ctg 384																
Arg	Asp	Lys	Leu	Val	Gln	Thr	Ile	Tyr	Arg	Gly	Ile	Glu	Pro	Thr	Leu	
		115					120					125				
ccc aac tgg ttc gcg gtg acc aag acg cgt aat ggc gcc gga ggg ggg 432																
Pro	Asn	Trp	Phe	Ala	Val	Thr	Lys	Thr	Arg	Asn	Gly	Ala	Gly	Gly	Gly	
		130				135					140					

aac aag gtg gtg gac gag tgc tac atc ccc aac tac ctc ctg ccc aag Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn Tyr Leu Leu Pro Lys 145 150 155 160	480
act cag ccc gag ctg cag tgg gcg tgg act aac atg gag gag tat ata Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn Met Glu Glu Tyr Ile 165 170 175	528
agc gcc tgt ttg aac ctg gcc gag cgc aaa cgg ctc gtg gcg cag cac Ser Ala Cys Leu Asn Leu Ala Glu Arg Lys Arg Leu Val Ala Gln His 180 185 190	576
ctg acc cac gtc agc cag acc cag gag cag aac aag gag aat ctg aac Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Leu Asn 195 200 205	624
ccc aat tct gac gcg cct gtc atc cgg tca aaa acc tcc gcg cgc tac Pro Asn Ser Asp Ala Pro Val Ile Arg Ser Lys Thr Ser Ala Arg Tyr 210 215 220	672
atg gag ctg gtc ggg tgg ctg gtg gac cgg ggc atc acc tcc gag aag Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys 225 230 235 240	720
cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala 245 250 255	768
tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys 260 265 270	816
atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala 275 280 285	864
ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu 290 295 300	912
aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala 305 310 315 320	960
cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala 325 330 335	1008
acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro 340 345 350	1056
ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp 355 360 365	1104
tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala 370 375 380	1152

aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc	1200
Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg	
385 390 395 400	
gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg	1248
Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val	
405 410 415	
atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggg aac agc	1296
Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser	
420 425 430	
acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt	1344
Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe	
435 440 445	
gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag	1392
Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln	
450 455 460	
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg	1440
Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val	
465 470 475 480	
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc	1488
Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala	
485 490 495	
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc	1536
Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val	
500 505 510	
gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc	1584
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala	
515 520 525	
gac agg tat ggc tgc cga tgg tta tct tcc aga ttg gct cga gga caa	1632
Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln	
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cct ctc tga	1641
Pro Leu	
545	

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 <212> PRT
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20 25 30	
Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile	
35 40 45	

Glu	Gln	Ala	Pro	Leu	Thr	Val	Ala	Glu	Lys	Leu	Gln	Arg	Asp	Phe	Leu	
50						55					60					
Val	Gln	Trp	Arg	Arg	Val	Ser	Lys	Ala	Pro	Glu	Ala	Leu	Phe	Phe	Val	
65					70					75					80	
Gln	Phe	Glu	Lys	Gly	Glu	Ser	Tyr	Phe	His	Leu	His	Ile	Leu	Val	Glu	
				85					90					95		
Thr	Thr	Gly	Val	Lys	Ser	Met	Val	Leu	Gly	Arg	Phe	Leu	Ser	Gln	Ile	
			100					105					110			
Arg	Asp	Lys	Leu	Val	Gln	Thr	Ile	Tyr	Arg	Gly	Ile	Glu	Pro	Thr	Leu	
		115					120					125				
Pro	Asn	Trp	Phe	Ala	Val	Thr	Lys	Thr	Arg	Asn	Gly	Ala	Gly	Gly	Gly	
	130					135					140					
Asn	Lys	Val	Val	Asp	Glu	Cys	Tyr	Ile	Pro	Asn	Tyr	Leu	Leu	Pro	Lys	
145					150					155					160	
Thr	Gln	Pro	Glu	Leu	Gln	Trp	Ala	Trp	Thr	Asn	Met	Glu	Glu	Tyr	Ile	
				165					170					175		
Ser	Ala	Cys	Leu	Asn	Leu	Ala	Glu	Arg	Lys	Arg	Leu	Val	Ala	Gln	His	
			180					185					190			
Leu	Thr	His	Val	Ser	Gln	Thr	Gln	Glu	Gln	Asn	Lys	Glu	Asn	Leu	Asn	
		195					200					205				
Pro	Asn	Ser	Asp	Ala	Pro	Val	Ile	Arg	Ser	Lys	Thr	Ser	Ala	Arg	Tyr	
	210					215					220					
Met	Glu	Leu	Val	Gly	Trp	Leu	Val	Asp	Arg	Gly	Ile	Thr	Ser	Glu	Lys	
225					230					235					240	
Gln	Trp	Ile	Gln	Glu	Asp	Gln	Ala	Ser	Tyr	Ile	Ser	Phe	Asn	Ala	Ala	
				245					250					255		
Ser	Asn	Ser	Arg	Ser	Gln	Ile	Lys	Ala	Ala	Leu	Asp	Asn	Ala	Gly	Lys	
			260					265					270			
Ile	Met	Ala	Leu	Thr	Lys	Ser	Ala	Pro	Asp	Tyr	Leu	Val	Gly	Pro	Ala	
		275					280					285				
Pro	Pro	Ala	Asp	Ile	Lys	Thr	Asn	Arg	Ile	Tyr	Arg	Ile	Leu	Glu	Leu	
	290					295					300					
Asn	Gly	Tyr	Glu	Pro	Ala	Tyr	Ala	Gly	Ser	Val	Phe	Leu	Gly	Trp	Ala	
305					310					315					320	
Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
				325					330					335		
Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
			340					345					350			
Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
		355					360					365				

Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
 370 375 380
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
 385 390 395 400
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
 405 410 415
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
 420 425 430
 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
 435 440 445
 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln
 450 455 460
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val
 465 470 475 480
 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala
 485 490 495
 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val
 500 505 510
 Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala
 515 520 525
 Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln
 530 535 540
 Pro Leu
 545

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 <213> AAV-1

<220>
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 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys
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 cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct 96
 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
 20 25 30
 tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag 144
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45

atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala 50 55 60	192
ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu 65 70 75 80	240
aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala 85 90 95	288
cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala 100 105 110	336
acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro 115 120 125	384
ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp 130 135 140	432
tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala 145 150 155 160	480
aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg 165 170 175	528
gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val 180 185 190	576
atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggg aac agc Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser 195 200 205	624
acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe 210 215 220	672
gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln 225 230 235 240	720
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val 245 250 255	768
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala 260 265 270	816
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val 275 280 285	864

gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc	912
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala	
290 295 300	
gac agg tac caa aac aaa tgt tct cgt cac gcg ggc atg ctt cag atg	960
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met	
305 310 315 320	
ctg ttt ccc tgc aag aca tgc gag aga atg aat cag aat ttc aac att	1008
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile	
325 330 335	
tgc ttc acg cac ggg acg aga gac tgt tca gag tgc ttc ccc ggc gtg	1056
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val	
340 345 350	
tca gaa tct caa ccg gtc gtc aga aag agg acg tat cgg aaa ctc tgt	1104
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys	
355 360 365	
gcc att cat cat ctg ctg ggg cgg gct ccc gag att gct tgc tcg gcc	1152
Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala	
370 375 380	
tgc gat ctg gtc aac gtg gac ctg gat gac tgt gtt tct gag caa taa	1200
Cys Asp Leu Val Asn Val Asp Leu Asp Asp Cys Val Ser Glu Gln	
385 390 395	

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 <212> PRT
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 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
 20 25 30
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45
 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala
 50 55 60
 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu
 65 70 75 80
 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala
 85 90 95
 Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
 100 105 110
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro
 115 120 125
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp

130	135	140
Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala 145 150 155 160		
Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg 165 170 175		
Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val 180 185 190		
Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser 195 200 205		
Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe 210 215 220		
Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln 225 230 235 240		
Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val 245 250 255		
Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala 260 265 270		
Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val 275 280 285		
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala 290 295 300		
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met 305 310 315 320		
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile 325 330 335		
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val 340 345 350		
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys 355 360 365		
Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala 370 375 380		
Cys Asp Leu Val Asn Val Asp Leu Asp Asp Cys Val Ser Glu Gln 385 390 395		

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Met	Glu	Leu	Val	Gly	Trp	Leu	Val	Asp	Arg	Gly	Ile	Thr	Ser	Glu	Lys	
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cag	tgg	atc	cag	gag	gac	cag	gcc	tcg	tac	atc	tcc	ttc	aac	gcc	gct	96
Gln	Trp	Ile	Gln	Glu	Asp	Gln	Ala	Ser	Tyr	Ile	Ser	Phe	Asn	Ala	Ala	
			20													
tcc	aac	tcg	cgg	tcc	cag	atc	aag	gcc	gct	ctg	gac	aat	gcc	ggc	aag	144
Ser	Asn	Ser	Arg	Ser	Gln	Ile	Lys	Ala	Ala	Leu	Asp	Asn	Ala	Gly	Lys	
			35													
atc	atg	gcg	ctg	acc	aaa	tcc	gcg	ccc	gac	tac	ctg	gta	ggc	ccc	gct	192
Ile	Met	Ala	Leu	Thr	Lys	Ser	Ala	Pro	Asp	Tyr	Leu	Val	Gly	Pro	Ala	
			50													
ccg	ccc	gcg	gac	att	aaa	acc	aac	cgc	atc	tac	cgc	atc	ctg	gag	ctg	240
Pro	Pro	Ala	Asp	Ile	Lys	Thr	Asn	Arg	Ile	Tyr	Arg	Ile	Leu	Glu	Leu	
65																
aac	ggc	tac	gaa	cct	gcc	tac	gcc	ggc	tcc	gtc	ttt	ctc	ggc	tgg	gcc	288
Asn	Gly	Tyr	Glu	Pro	Ala	Tyr	Ala	Gly	Ser	Val	Phe	Leu	Gly	Trp	Ala	
			85													
cag	aaa	agg	ttc	ggg	aag	cgc	aac	acc	atc	tgg	ctg	ttt	ggg	ccg	gcc	336
Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
			100													
acc	acg	ggc	aag	acc	aac	atc	gcg	gaa	gcc	atc	gcc	cac	gcc	gtg	ccc	384
Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
			115													
ttc	tac	ggc	tgc	gtc	aac	tgg	acc	aat	gag	aac	ttt	ccc	ttc	aat	gat	432
Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
			130													
tgc	gtc	gac	aag	atg	gtg	atc	tgg	tgg	gag	gag	ggc	aag	atg	acg	gcc	480
Cys	Val	Asp	Lys	Met	Val	Ile	Trp	Trp	Glu	Glu	Gly	Lys	Met	Thr	Ala	
145																
aag	gtc	gtg	gag	tcc	gcc	aag	gcc	att	ctc	ggc	ggc	agc	aag	gtg	cgc	528
Lys	Val	Val	Glu	Ser	Ala	Lys	Ala	Ile	Leu	Gly	Gly	Ser	Lys	Val	Arg	
			165													
gtg	gac	caa	aag	tgc	aag	tcg	tcc	gcc	cag	atc	gac	ccc	acc	ccc	gtg	576
Val	Asp	Gln	Lys	Cys	Lys	Ser	Ser	Ala	Gln	Ile	Asp	Pro	Thr	Pro	Val	
			180													
atc	gtc	acc	tcc	aac	acc	aac	atg	tgc	gcc	gtg	att	gac	ggg	aac	agc	624
Ile	Val	Thr	Ser	Asn	Thr	Asn	Met	Cys	Ala	Val	Ile	Asp	Gly	Asn	Ser	
			195													
acc	acc	ttc	gag	cac	cag	cag	ccg	ttg	cag	gac	cgg	atg	ttc	aaa	ttt	672

Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	Arg	Met	Phe	Lys	Phe		
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gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag 720																	
Glu	Leu	Thr	Arg	Arg	Leu	Glu	His	Asp	Phe	Gly	Lys	Val	Thr	Lys	Gln		
225					230					235					240		
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg 768																	
Glu	Val	Lys	Glu	Phe	Phe	Arg	Trp	Ala	Gln	Asp	His	Val	Thr	Glu	Val		
			245						250					255			
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc 816																	
Ala	His	Glu	Phe	Tyr	Val	Arg	Lys	Gly	Gly	Ala	Asn	Lys	Arg	Pro	Ala		
			260					265					270				
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc 864																	
Pro	Asp	Asp	Ala	Asp	Lys	Ser	Glu	Pro	Lys	Arg	Ala	Cys	Pro	Ser	Val		
		275					280					285					
gcg gat cca tcg acg tca gac gcg gaa gga gct cgg gtg gac ttt gcc 912																	
Ala	Asp	Pro	Ser	Thr	Ser	Asp	Ala	Glu	Gly	Ala	Pro	Val	Asp	Phe	Ala		
		290				295					300						
gac agg tat ggc tgc cga tgg tta tct tcc aga ttg gct cga gga caa 960																	
Asp	Arg	Tyr	Gly	Cys	Arg	Trp	Leu	Ser	Ser	Arg	Leu	Ala	Arg	Gly	Gln		
305					310					315					320		
cct ctc tga 969																	
Pro	Leu																

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 <223> minor splice site

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 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45
 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala
 50 55 60
 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu
 65 70 75 80
 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala
 85 90 95

Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
 100 105 110
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro
 115 120 125
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp
 130 135 140
 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
 145 150 155 160
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
 165 170 175
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
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 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
 195 200 205
 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
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 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln
 225 230 235 240
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val
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 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala
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 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val
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aaa gcc aac cag caa aag cag gac gac ggc cgg ggt ctg gtg ctt cct	Lys Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro	35 40 45	144	
ggc tac aag tac ctc gga ccc ttc aac gga ctc gac aag ggg gag ccc	Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro	50 55 60	192	
gtc aac gcg gcg gac gca gcg gcc ctc gag cac gac aag gcc tac gac	Val Asn Ala Ala Asp Ala Ala Leu Glu His Asp Lys Ala Tyr Asp	65 70 75 80	240	
cag cag ctc aaa gcg ggt gac aat ccg tac ctg cgg tat aac cac gcc	Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala	85 90 95	288	
gac gcc gag ttt cag gag cgt ctg caa gaa gat acg tct ttt ggg ggc	Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly	100 105 110	336	
aac ctc ggg cga gca gtc ttc cag gcc aag aag cgg gtt ctc gaa cct	Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro	115 120 125	384	
ctc ggt ctg gtt gag gaa ggc gct aag acg gct cct gga aag aaa cgt	Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg	130 135 140	432	
ccg gta gag cag tcg cca caa gag cca gac tcc tcc tcg ggc atc ggc	Pro Val Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly	145 150 155 160	480	
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ggc gac tca gag tca gtc ccc gat cca caa cct ctc gga gaa cct cca	Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro	180 185 190	576	
gca acc ccc gct gct gtg gga cct act aca atg gct tca ggc ggt ggc	Ala Thr Pro Ala Ala Val Gly Pro Thr Thr Met Ala Ser Gly Gly Gly	195 200 205	624	
gca cca atg gca gac aat aac gaa ggc gcc gac gga gtg ggt aat gcc	Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala	210 215 220	672	
tca gga aat tgg cat tgc gat tcc aca tgg ctg ggc gac aga gtc atc	Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile	225 230 235 240	720	
acc acc agc acc cgc acc tgg gcc ttg ccc acc tac aat aac cac ctc	Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu		768	

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Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	Phe	Asp	Phe	Asn	Arg	Phe					
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cac	tgc	cac	ttt	tca	cca	cgt	gac	tgg	cag	cga	ctc	atc	aac	aac	aat	912				
His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp	Gln	Arg	Leu	Ile	Asn	Asn	Asn					
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Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly	Cys	Leu	Pro	Pro	Phe	Pro	Ala					
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	370					375					380									
agc	caa	gcc	gtg	gga	cgt	tca	tcc	ttt	tac	tgc	ctg	gaa	tat	ttc	cct	1200				
Ser	Gln	Ala	Val	Gly	Arg	Ser	Ser	Phe	Tyr	Cys	Leu	Glu	Tyr	Phe	Pro					
385					390					395					400					
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Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	Thr	Phe	Ser	Tyr	Thr	Phe					
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gag	gaa	gtg	cct	ttc	cac	agc	agc	tac	gcg	cac	agc	cag	agc	ctg	gac	1296				
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cgg	ctg	atg	aat	cct	ctc	atc	gac	caa	tac	ctg	tat	tac	ctg	aac	aga	1344				
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act	caa	aat	cag	tcc	gga	agt	gcc	caa	aac	aag	gac	ttg	ctg	ttt	agc	1392				
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	450					455					460									
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Asp	Asp	Glu	Asp	Lys	Phe	Phe	Pro	Met	Ser	Gly	Val	Met	Ile	Phe	Gly					
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Lys	Asn	Pro	Pro	Pro	Gln	Ile	Leu	Ile	Lys	Asn	Thr	Pro	Val	Pro	Ala					
				645					650					655						
aat	cct	ccg	gcg	gag	ttt	tca	gct	aca	aag	ttt	gct	tca	ttc	atc	acc	2016				
Asn	Pro	Pro	Ala	Glu	Phe	Ser	Ala	Thr	Lys	Phe	Ala	Ser	Phe	Ile	Thr					
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	690					695					700									
tat	gca	aaa	tct	gcc	aac	gtt	gat	ttt	act	gtg	gac	aac	aat	gga	ctt	2160				
Tyr	Ala	Lys	Ser	Ala	Asn	Val	Asp	Phe	Thr	Val	Asp	Asn	Asn	Gly	Leu					
705					710					715					720					
tat	act	gag	cct	cgc	ccc	att	ggc	acc	cgt	tac	ctt	acc	cgt	ccc	ctg	2208				
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Lys	Ala	Asn	Gln	Gln	Lys	Gln	Asp	Asp	Gly	Arg	Gly	Leu	Val	Leu	Pro
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Gly	Tyr	Lys	Tyr	Leu	Gly	Pro	Phe	Asn	Gly	Leu	Asp	Lys	Gly	Glu	Pro
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Val	Asn	Ala	Ala	Asp	Ala	Ala	Ala	Leu	Glu	His	Asp	Lys	Ala	Tyr	Asp
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Gln	Gln	Leu	Lys	Ala	Gly	Asp	Asn	Pro	Tyr	Leu	Arg	Tyr	Asn	His	Ala
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Asp	Ala	Glu	Phe	Gln	Glu	Arg	Leu	Gln	Glu	Asp	Thr	Ser	Phe	Gly	Gly
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Lys	Thr	Gly	Gln	Gln	Pro	Ala	Lys	Lys	Arg	Leu	Asn	Phe	Gly	Gln	Thr
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Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro	Gln	Pro	Leu	Gly	Glu	Pro	Pro
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Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly	Ala	Asp	Gly	Val	Gly	Asn	Ala
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Thr	Thr	Ser	Thr	Arg	Thr	Trp	Ala	Leu	Pro	Thr	Tyr	Asn	Asn	His	Leu
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Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr	Gly	Ala	Ser	Asn	Asp	Asn	His

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Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	Phe	Asp	Phe	Asn	Arg	Phe
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His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp	Gln	Arg	Leu	Ile	Asn	Asn	Asn
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Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn	Phe	Lys	Leu	Phe	Asn	Ile	Gln
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Val	Lys	Glu	Val	Thr	Thr	Asn	Asp	Gly	Val	Thr	Thr	Ile	Ala	Asn	Asn
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Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser	Asp	Ser	Glu	Tyr	Gln	Leu	Pro
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Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly	Cys	Leu	Pro	Pro	Phe	Pro	Ala
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Asp	Val	Phe	Met	Ile	Pro	Gln	Tyr	Gly	Tyr	Leu	Thr	Leu	Asn	Asn	Gly
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Ser	Gln	Ala	Val	Gly	Arg	Ser	Ser	Phe	Tyr	Cys	Leu	Glu	Tyr	Phe	Pro
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Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	Thr	Phe	Ser	Tyr	Thr	Phe
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Glu	Glu	Val	Pro	Phe	His	Ser	Ser	Tyr	Ala	His	Ser	Gln	Ser	Leu	Asp
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Arg	Leu	Met	Asn	Pro	Leu	Ile	Asp	Gln	Tyr	Leu	Tyr	Tyr	Leu	Asn	Arg
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Thr	Gln	Asn	Gln	Ser	Gly	Ser	Ala	Gln	Asn	Lys	Asp	Leu	Leu	Phe	Ser
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Gly	Pro	Cys	Tyr	Arg	Gln	Gln	Arg	Val	Ser	Lys	Thr	Lys	Thr	Asp	Asn
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Gly	Arg	Glu	Ser	Ile	Ile	Asn	Pro	Gly	Thr	Ala	Met	Ala	Ser	His	Lys
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Asp	Asp	Glu	Asp	Lys	Phe	Phe	Pro	Met	Ser	Gly	Val	Met	Ile	Phe	Gly
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Lys	Glu	Ser	Ala	Gly	Ala	Ser	Asn	Thr	Ala	Leu	Asp	Asn	Val	Met	Ile
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Thr	Asp	Glu	Glu	Glu	Ile	Lys	Ala	Thr	Asn	Pro	Val	Ala	Thr	Glu	Arg
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Phe	Gly	Thr	Val	Ala	Val	Asn	Phe	Gln	Ser	Ser	Ser	Thr	Asp	Pro	Ala

580							585					590				
Thr	Gly	Asp	Val	His	Ala	Met	Gly	Ala	Leu	Pro	Gly	Met	Val	Trp	Gln	
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Asp	Arg	Asp	Val	Tyr	Leu	Gln	Gly	Pro	Ile	Trp	Ala	Lys	Ile	Pro	His	
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Lys	Asn	Pro	Pro	Pro	Gln	Ile	Leu	Ile	Lys	Asn	Thr	Pro	Val	Pro	Ala	
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Asn	Pro	Pro	Ala	Glu	Phe	Ser	Ala	Thr	Lys	Phe	Ala	Ser	Phe	Ile	Thr	
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Gln	Tyr	Ser	Thr	Gly	Gln	Val	Ser	Val	Glu	Ile	Glu	Trp	Glu	Leu	Gln	
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Asp	Ser	Ser	Ser	Gly	Ile	Gly	Lys	Thr	Gly	Gln	Gln	Pro	Ala	Lys	Lys	
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aga ctc aat ttt ggt cag act ggc gac tca gag tca gtc ccc gat cca																144
Arg	Leu	Asn	Phe	Gly	Gln	Thr	Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro	
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caa cct ctc gga gaa cct cca gca acc ccc gct gct gtg gga cct act																192
Gln	Pro	Leu	Gly	Glu	Pro	Pro	Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr	
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aca atg gct tca ggc ggt ggc gca cca atg gca gac aat aac gaa ggc																240
Thr	Met	Ala	Ser	Gly	Gly	Gly	Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly	
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Ala Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr	
85 90 95	
tgg ctg ggc gac aga gtc atc acc acc agc acc cgc acc tgg gcc ttg	336
Trp Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu	
100 105 110	
ccc acc tac aat aac cac ctc tac aag caa atc tcc agt gct tca acg	384
Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr	
115 120 125	
ggg gcc agc aac gac aac cac tac ttc ggc tac agc acc ccc tgg ggg	432
Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly	
130 135 140	
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Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp	
145 150 155 160	
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Gln Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn	
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Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly	
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Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val Gln Val Phe Ser	
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Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly	
210 215 220	
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Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly	
225 230 235 240	
tac ctg acg ctc aac aat ggc agc caa gcc gtg gga cgt tca tcc ttt	768
Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe	
245 250 255	
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Tyr Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn	
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Phe Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr	
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Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln	
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Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser Gly Ser Ala Gln	
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gct tca aaa tat aac ctc aat ggg cgt gaa tcc atc atc aac cct ggc Ala Ser Lys Tyr Asn Leu Asn Gly Arg Glu Ser Ile Ile Asn Pro Gly 370 375 380	1152
act gct atg gcc tca cac aaa gac gac gaa gac aag ttc ttt ccc atg Thr Ala Met Ala Ser His Lys Asp Asp Glu Asp Lys Phe Phe Pro Met 385 390 395 400	1200
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gaa att gaa tgg gag ctg cag aaa gaa aac agc aag cgc tgg aat ccc Glu Ile Glu Trp Glu Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro 545 550 555 560	1680

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Thr	Val	Asp	Asn	Asn	Gly	Leu	Tyr	Thr	Glu	Pro	Arg	Pro	Ile	Gly	Thr	
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Arg	Leu	Asn	Phe	Gly	Gln	Thr	Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro		
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Gln	Pro	Leu	Gly	Glu	Pro	Pro	Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr		
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Thr	Met	Ala	Ser	Gly	Gly	Gly	Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly		
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Trp	Leu	Gly	Asp	Arg	Val	Ile	Thr	Thr	Ser	Thr	Arg	Thr	Trp	Ala	Leu		
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Pro	Thr	Tyr	Asn	Asn	His	Leu	Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr		
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Gly	Ala	Ser	Asn	Asp	Asn	His	Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly		
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Tyr	Phe	Asp	Phe	Asn	Arg	Phe	His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp		
145					150					155					160		
Gln	Arg	Leu	Ile	Asn	Asn	Asn	Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn		
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Val	Thr	Thr	Ile	Ala	Asn	Asn	Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser		
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Asp	Ser	Glu	Tyr	Gln	Leu	Pro	Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly		

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Cys 225	Leu	Pro	Pro	Phe	Pro 230	Ala	Asp	Val	Phe	Met 235	Ile	Pro	Gln	Tyr	Gly 240
Tyr	Leu	Thr	Leu	Asn 245	Asn	Gly	Ser	Gln	Ala 250	Val	Gly	Arg	Ser	Ser	Phe 255
Tyr	Cys	Leu	Glu 260	Tyr	Phe	Pro	Ser	Gln 265	Met	Leu	Arg	Thr	Gly 270	Asn	Asn
Phe	Thr	Phe 275	Ser	Tyr	Thr	Phe	Glu 280	Glu	Val	Pro	Phe	His 285	Ser	Ser	Tyr
Ala	His 290	Ser	Gln	Ser	Leu	Asp 295	Arg	Leu	Met	Asn	Pro 300	Leu	Ile	Asp	Gln
Tyr 305	Leu	Tyr	Tyr	Leu	Asn 310	Arg	Thr	Gln	Asn	Gln 315	Ser	Gly	Ser	Ala	Gln 320
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Gln	Pro	Lys	Asn 340	Trp	Leu	Pro	Gly	Pro 345	Cys	Tyr	Arg	Gln	Gln 350	Arg	Val
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Ser	Gly	Val	Met	Ile 405	Phe	Gly	Lys	Glu	Ser 410	Ala	Gly	Ala	Ser	Asn	Thr 415
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Ser 450	Ser	Ser	Thr	Asp	Pro	Ala 455	Thr	Gly	Asp	Val	His 460	Ala	Met	Gly	Ala
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Ile	Trp	Ala	Lys	Ile 485	Pro	His	Thr	Asp	Gly 490	His	Phe	His	Pro	Ser	Pro 495
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Lys	Asn	Thr 515	Pro	Val	Pro	Ala	Asn 520	Pro	Pro	Ala	Glu	Phe 525	Ser	Ala	Thr
Lys	Phe	Ala	Ser	Phe	Ile	Thr	Gln	Tyr	Ser	Thr	Gly	Gln	Val	Ser	Val

530 535 540

Glu Ile Glu Trp Glu Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro
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Glu Val Gln Tyr Thr Ser Asn Tyr Ala Lys Ser Ala Asn Val Asp Phe
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580 585 590

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gac gga gtg ggt aat gcc tca gga aat tgg cat tgc gat tcc aca tgg	96
Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr Trp	
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ctg ggc gac aga gtc atc acc acc agc acc cgc acc tgg gcc ttg ccc	144
Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro	
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acc tac aat aac cac ctc tac aag caa atc tcc agt gct tca acg ggg	192
Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly	
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gcc agc aac gac aac cac tac ttc ggc tac agc acc ccc tgg ggg tat	240
Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr	
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Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp Gln	
85 90 95	
cga ctc atc aac aac aat tgg gga ttc cgg ccc aag aga ctc aac ttc	336
Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn Phe	
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Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly Val	
115 120 125	
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 35 40 45
 Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly
 50 55 60

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Arg	Leu	Ile	Asn 100	Asn	Asn	Trp	Gly	Phe 105	Arg	Pro	Lys	Arg	Leu 110	Asn	Phe
Lys	Leu	Phe 115	Asn	Ile	Gln	Val	Lys 120	Glu	Val	Thr	Thr	Asn 125	Asp	Gly	Val
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Ser 145	Glu	Tyr	Gln	Leu	Pro 150	Tyr	Val	Leu	Gly	Ser 155	Ala	His	Gln	Gly	Cys 160
Leu	Pro	Pro	Phe	Pro 165	Ala	Asp	Val	Phe	Met 170	Ile	Pro	Gln	Tyr	Gly 175	Tyr
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Cys	Leu	Glu 195	Tyr	Phe	Pro	Ser	Gln 200	Met	Leu	Arg	Thr	Gly 205	Asn	Asn	Phe
Thr 210	Phe	Ser	Tyr	Thr	Phe	Glu 215	Glu	Val	Pro	Phe 220	His	Ser	Ser	Tyr	Ala
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